

<212>

DNA

<213> Artificial Sequence

SEQUENCE LISTING

<110> William IV Locarnini, Stephen Alister Chen, Robert Yung Ming Bartholomeusz, Angeline Isom, Harriet <120> An assay <130> 2378750/EJH <140> 09/781,891 <141> 2001-02-02 <150> 60/179,948 <151> 2000-02-03 <160> 23 <170> PatentIn version 3.0 <210> 1 <211> 23 <212> DNA <213> Artificial Sequence <220> <223> Description of Artificial Sequence: Primer gcctcatttt gtgggtcacc ata 23 <210> 2 <211> 20 <212> DNA <213> Artificial Sequence <223> Description of Artificial Sequence:Primer <400> 2 tctctgacat actttccaat 20 <210> 3 <211> 18 <212> DNA <213> Artificial Sequence <220> Description of Artificial Sequence: Primer <223> <400> 18 tgcacgattc ctgctcaa <210> <211> 20

```
<220>
<223>
       Description of Artificial Sequence: Primer
<400>
tttctcaaag gtggagacag
                                                                                 20
<210>
<211>
       181
<212>
       PRT
<213> Artificial Sequence
<220>
<223>
       Description of Artificial Sequence: Reference HBV
        (Formula I)
<220>
<221> variant
<222>
       (2)..(2)
\langle 223 \rangle X = N or D
<220>
<221> variant
<222>
       (17)..(17)
\langle 223 \rangle X = I or P
<220>
<221> variant
<222>
       (29)..(29)
\langle 223 \rangle X = I or V
<220>
<221> variant
<222>
       (35)..(35)
\langle 223 \rangle X = S or D
<220>
<221> variant
<222>
       (44)..(44)
\langle 223 \rangle X = T or N
<220>
<221> variant
<222>
       (46)..(46)
\langle 223 \rangle X = R or N
<220>
<221> variant
<222>
       (47)..(47)
\langle 223 \rangle X = N or I
<220>
<221> variant
<222>
       (48)..(48)
<223> X = any amino acid
<220>
<221>
       variant
```

<222>

(49)..(49)

```
<223> X = N
<220>
<221> variant
<222> (50)..(50)
<223> X = N or Y or H
<220>
<221> variant
      (52)..(52)
<222>
<223> X = H or Y
<220>
<221> variant
       (53)..(53)
<222>
\langle 223 \rangle X = G or R
<220>
<221> variant
<222> (54)..(56)
<223> X = any amino acid
<220>
<221> variant
<222>
      (57)..(57)
\langle 223 \rangle X = D or N
<220>
<221> variant
<222> (60)..(60)
\langle 223 \rangle X = D or N
<220>
<221> variant
<222> (61)..(61)
<223> X = S or Y
<220>
<221> variant
<222> (65)..(65)
\langle 223 \rangle X = N or Q
<220>
<221> variant
<222> (71)..(71)
\langle 223 \rangle X = L or M
<220>
<221> variant
<222> (75)..(75)
<223> X = K or Q
<220>
<221> variant
       (77)..(77)
<222>
\langle 223 \rangle X = Y or F
<220>
```

<221> variant

```
<222> (79)..(79)
<223> X = R or W
<220>
<221> variant
<222> (84)..(84)
\langle 223 \rangle X = Y or L
<220>
<221> variant
<222> (85)..(85)
\langle 223 \rangle X = S or A
<220>
<221> variant
<222> (89)..(89)
<223> X = I or V
<220>
<221> variant
<222> (95)..(95)
<223> X = I or L
<220>
<221> variant
<222> (99)..(99)
<223> X = V or G
<220>
<221> variant
<222> (114)..(114)
\langle 223 \rangle X = C or L
<220>
<221> variant
<222> (115)..(115)
\langle 223 \rangle X = A or S
<220>
<221> variant
<222> (116)..(116)
\langle 223 \rangle X = V or M
<220>
<221> variant
<222> (117)..(117)
<223> X = V or T
<220>
<221> variant
<222> (118)..(118)
<223> X = R or C
<220>
<221> variant
<222> (122)..(122)
<223> X = F or P
```

```
<221> variant
<222> (125)..(125)
\langle 223 \rangle X = L \text{ or } V
<220>
<221> variant
<222> (126)..(126)
<223> X = A or V
<220>
<221> variant
<222> (128)..(128)
\langle 223 \rangle X = S or A
<220>
<221> variant <222> (133)..(133)
\langle 223 \rangle X = V or L or M
<220>
<221> variant
<222> (138)..(138)
<223> X = K or R
<220>
<221> variant
<222> (139)..(139)
\langle 223 \rangle X = S or T
<220>
<221> variant
<222> (140)..(140)
\langle 223 \rangle X = V or G
<220>
<221> variant
<222> (141)..(141)
\langle 223 \rangle X = Q or E
<220>
<221> variant
<222> (143)..(143)
\langle 223 \rangle X = L or S or R
<220>
<221> variant
<222> (145)..(145)
\langle 223 \rangle X = S or F
<220>
<221> variant
<222> (147)..(147)
<223> X = F or Y
<220>
<221> variant
```

<222> (148)..(148) <223> X = T or A

```
<220>
<221> variant
<222> (149)..(149)
\langle 223 \rangle X = A or S
<220>
<221> variant
<222> (150)..(150)
<223> X = V or I
<220>
<221> variant
<222> (151)..(151)
\langle 223 \rangle X = T or C
<220>
<221> variant
<222>
       (152)..(152)
\langle 223 \rangle X = F or V
<220>
<221> variant
<222> (153)..(153)
<223> X = F or V
<220>
<221> variant
<222> (156)..(156)
\langle 223 \rangle X = S or D
<220>
<221> variant
<222> (157)..(157)
\langle 223 \rangle X = L or V
<220>
<221> variant
<222> (162)..(162)
<223> X = N
<220>
<221> variant
<222> (164)..(165)
\langle 223 \rangle X = N or Q
<220>
<221> variant
<222> (174)..(174)
<223> X = N
<220>
<221> variant
<222> (179)..(179)
\langle 223 \rangle X = V or I
<400> 5
Ser Xaa Leu Ser Trp Leu Ser Leu Asp Val Ser Ala Ala Phe Tyr His
                                        10
```

```
Xaa Pro Leu His Pro Ala Ala Met Pro His Leu Leu Xaa Gly Ser Ser 20 25 30
```

Gly Leu Xaa Arg Tyr Val Ala Arg Leu Ser Ser Xaa Ser Xaa Xaa Xaa 35 40 45

Xaa Xaa Gln Xaa Xaa Xaa Xaa Xaa Leu His Xaa Xaa Cys Ser Arg 50 60

Xaa Leu Tyr Val Ser Leu Xaa Leu Leu Tyr Xaa Thr Xaa Gly Xaa Lys 65 70 75 80

Leu His Leu Xaa Xaa His Pro Ile Xaa Leu Gly Phe Arg Lys Xaa Pro 85 90 95

Met Gly Xaa Gly Leu Ser Pro Phe Leu Leu Ala Gln Phe Thr Ser Ala 100 105 110

Ile Xaa Xaa Xaa Xaa Arg Ala Phe Xaa His Cys Xaa Xaa Phe Xaa 115 120 125

Tyr Met Asp Asp Xaa Val Leu Gly Ala Xaa Xaa Xaa Xaa His Xaa Glu 130 135 140

Leu Xaa Pro Xaa Lys Thr Lys Arg Trp Gly Tyr Ser Leu Xaa Phe Met
165 170 175

Gly Tyr Xaa Ile Gly 180

<210> 6

<211> 226

<212> PRT

<213> Artificial Sequence

<220>

<220>

<221> variant

<222> (2)..(2)

<223> X = E or G or D

<220>

<221> variant

<222> (3)..(3)

 $\langle 223 \rangle$ X = N or S or K

<220>

<221> variant

<222> (4)..(4)

 $\langle 223 \rangle$ X = I or T

```
<221> variant
<222> (5)..(5)
<223> X = T or A
<220>
<221> variant
<222> (8)..(8)
\langle 223 \rangle X = F or L
<220>
<221> variant
<222> (10)..(10)
<223> X = G \text{ or } R
<220>
<221> variant
<222>
       (13)..(13)
<223> X = L or R
<220>
<221> variant
<222> (18)..(18)
<223> X = G or V
<220>
<221> variant
<222> (19)..(19)
<223> X = F \text{ or } C
<220>
<221> variant
<222> (21)..(21)
\langle 223 \rangle X = L or S or W
<220>
<221> variant
<222> (24)..(24)
<223> X = R or K
<220>
<221> variant
<222> (26)..(26)
<223> X = L or R
<220>
<221> variant
      (27)..(27)
<222>
<223> X = T or K
<220>
<221> variant <222> (30)..(30)
<223> X = Q \text{ or } K
<220>
<221> variant <222> (31)..(31)
```

<223> X = D or H

```
<220>
<221> variant
<222> (40)..(40)
\langle 223 \rangle X = N
<220>
<221> variant
<222> (44)..(44)
\langle 223 \rangle X = G or E or A
<220>
<221> variant <222> (45)..(45)
\langle 223 \rangle X = S or A or V or T or L
<220>
<221> variant
<222> (46)..(46)
<223> X = P or T
<220>
<221> variant
<222> (47)..(47)
<223> X = V or R or T or K or G
<220>
<221> variant
<222> (49)..(49)
\langle 223 \rangle X = L or P
<220>
<221> variant
<222> (51)..(51)
<223> X = Q or L or K
<220>
<221> variant
<222> (52)..(52)
<223> \dot{X} = N
<220>
<221> variant
<222> (53)..(53)
\langle 223 \rangle X = S or L
<220>
<221> variant
<222> (56)..(56)
<223> X = P or Q
<220>
<221> variant
       (57)..(57)
<222>
\langle 223 \rangle X = T or I
<220>
<221> variant
<222> (59)..(59)
<223> X = N or S
```

```
<220>
<221> variant
<222> (61)..(61)
<223> X = S or L
<220>
<221> variant <222> (63)..(63)
\langle 223 \rangle X = T or I
<220>
<221> variant
<222> (64)..(64)
<223> X = S or C
<220>
<221> variant
<222> (68)..(68)
\langle 223 \rangle X = I or T
<220>
<221> variant
<222> (70)..(70)
<223> X = P or A
<220>
<221> variant
<222> (78)..(78)
\langle 223 \rangle X = R or Q
<220>
<221> variant
<222> (85)..(85)
<223> X = F or C
<220>
<221> variant
<222> (100)..(100)
\langle 223 \rangle X = Y or C
<220>
<221> variant
<222> (105)..(105)
<223> X = P or H or S
<220>
<221> variant
       (110)..(110)
<222>
<223> X = I or L
<220>
<221> variant <222> (112)..(112)
\langle 223 \rangle X = G or R
<220>
<221> variant <222> (113)..(113)
```

```
\langle 223 \rangle X = S or T
<220>
<221> variant
<222> (114)..(114)
<223> X = T or S
<220>
<221> variant
<222> (118)..(118)
<223> X = T or V or A
<220>
<221> variant
<222> (119)..(119)
<223> X = G or E or Q
<220>
<221> variant
<222> (120)..(120)
<223> X = P or A or S
<220>
<221> variant
<222> (122)..(122)
\langle 223 \rangle X = K or R
<220>
<221> variant
<222> (125)..(125)
\langle 223 \rangle X = T or M
<220>
<221> variant
<222> (126)..(126)
<223> X = T or I or S or A
<220>
<221> variant
<222> (127)..(127)
<223> X = P or T or A or I or L
<220>
<221> variant
<222> (128)..(128)
<223> X = A or V
<220>
<221> variant <222> (131)..(131)
\langle 223 \rangle X = N or T
<220>
<221> variant
<222> (133)..(133)
<223> X = M or K or L
<220>
```

<221> variant

```
<222> (134)..(134)
\langle 223 \rangle X = F or Y or I
<220>
<221> variant
<222> (136)..(136)
<223> X = S or Y
<220>
<221> variant <222> (137)..(137)
\langle 223 \rangle X = C or S
<220>
<221> variant
<222> (140)..(140)
<223> X = T or I or S
<220>
<221> variant
<222> (143)..(143)
<223> X = T or S
<220>
<221> variant
<222> (144)..(144)
\langle 223 \rangle X = D or A
<220>
<221> variant
<222> (146)..(146)
<223> X = N
<220>
<221> variant
<222> (155)..(155)
\langle 223 \rangle X = S or T
<220>
<221> variant
<222> (158)..(158)
\langle 223 \rangle X = F or L
<220>
<221> variant
<222> (159)..(159)
\langle 223 \rangle X = A or G or V
<220>
<221> variant
<222> (160)..(160)
<223> X = K or R or T
<220>
<221> variant <222> (161)..(161)
\langle 223 \rangle X = Y or F
```

```
<221> variant
<222> (165)..(165)
<223> X = W or G
<220>
<221> variant
<222> (166)..(166)
\langle 223 \rangle X = A or G
<220>
<221> variant
<222> (168)..(168)
<223> X = V or A
<220>
<221> variant
<222>
       (170)..(170)
\langle 223 \rangle X = F or L
<220>
<221> variant
<222> (174)..(174)
\langle 223 \rangle X = S or N
<220>
<221> variant
<222> (176)..(176)
<223> X = V \text{ or } A
<220>
<221> variant
<222> (177)..(177)
\langle 223 \rangle X = P or Q
<220>
<221> variant
<222> (182)..(182)
<223> X = W or C or S
<220>
<221> variant
<222> (183)..(183)
\langle 223 \rangle X = F or C
<220>
<221> variant
<222> (184)..(184)
\langle 223 \rangle X = V or D or A
<220>
<221> variant <222> (185)..(185)
\langle 223 \rangle X = G or E
<220>
<221> variant <222> (187)..(187)
\langle 223 \rangle X = S or F
```

```
<220>
 <221> variant
 <222> (189)..(189)
 <223> X = T or I
 <220>
 <221> variant
 <222> (192)..(192)
 \langle 223 \rangle X = L or P
 <220>
<221> variant
<222> (193)..(193)
<223> X = S or L
<220>
 <221> variant
 <222> (194)..(194)
\langle 223 \rangle X = A or V
<220>
<221> variant
 <222> (197)..(197)
<223> X = M or I
<220>
<221> variant
 <222> (198)..(198)
 <223> X = M \text{ or } I
 <220>
 <221> variant
 <222> (200)..(200)
 \langle 223 \rangle X = Y or F
<220>
<221> variant
<222> (202)..(202)
<223> X = G or E
<220>
<221> variant
<222> (204)..(204)
 <223> X = S or N or K
<220>
<221> variant
<222> (205)..(205)
<223> X = L or Q
<220>
<221> variant <222> (206)..(206)
 <223> X = Y or F or H or C
<220>
<221> variant
<222> (207)..(207)
<223> X = S or G or N or D or T
```

```
<220>
<221> variant
      (209)..(209)
<222>
\langle 223 \rangle X = V or L
<220>
<221> variant
      (210)..(210)
<222>
\langle 223 \rangle X = S or N
<220>
<221>
      variant
<222>
       (213)..(213)
\langle 223 \rangle X = I or M or L
<220>
<221> variant
<222>
       (220)..(220)
\langle 223 \rangle X = F or C
<220>
<221> variant
<222> (221)..(221)
\langle 223 \rangle X = C or Y
<220>
<221> variant
<222>
      (223)..(223)
\langle 223 \rangle X = W or R
<220>
<221> variant
<222>
      (224)..(224)
<223> X = V or A
<220>
<221> variant
<222>
      (225)..(225)
<223> X = Y or I or S
<400> 6
Met Xaa Xaa Xaa Ser Gly Xaa Leu Xaa Pro Leu Xaa Val Leu Gln
Ala Xaa Xaa Phe Xaa Leu Thr Xaa Ile Xaa Xaa Ile Pro Xaa Ser Leu
             20
Xaa Ser Trp Trp Thr Ser Leu Xaa Phe Leu Gly Xaa Xaa Xaa Cys
                              40
Xaa Gly Xaa Xaa Kaa Gln Ser Xaa Xaa Ser Xaa His Xaa Pro Xaa Xaa
    50
                          55
Cys Pro Pro Xaa Cys Xaa Gly Tyr Arg Trp Met Cys Leu Xaa Arg Phe
Ile Ile Phe Leu Xaa Ile Leu Leu Cys Leu Ile Phe Leu Leu Val
                 85
                                       90
```

```
Leu Leu Asp Xaa Gln Gly Met Leu Xaa Val Cys Pro Leu Xaa Pro Xaa
                                 105
Xaa Xaa Thr Thr Ser Xaa Xaa Xaa Cys Xaa Thr Cys Xaa Xaa Xaa Xaa
        115
                            120
Gln Gly Xaa Ser Xaa Xaa Pro Xaa Xaa Cys Cys Xaa Lys Pro Xaa Xaa
                        135
Gly Xaa Cys Thr Cys Ile Pro Ile Pro Ser Xaa Trp Ala Xaa Xaa Xaa
                    150
Xaa Leu Trp Glu Xaa Xaa Ser Xaa Arg Xaa Ser Trp Leu Xaa Leu Leu
Xaa Xaa Phe Val Gln Xaa Xaa Xaa Leu Xaa Pro Xaa Val Trp Xaa
            180
                                185
Xaa Xaa Ile Trp Xaa Xaa Trp Xaa Trp Xaa Pro Xaa Xaa Xaa Ile
Xaa Xaa Pro Phe Xaa Pro Leu Leu Pro Ile Phe Xaa Xaa Leu Xaa Xaa
                                             220
                        215
Xaa Ile
225
<210>
      7
<211> 261
<212> DNA
<213> Artificial Sequence
<220>
<223>
      Description of Artificial Sequence: Nucleotide Sequence
       encoding the HBsAg from a reference HBV.
<220>
<221>
      variant
<222>
      (3)..(3)
<223> N = A or C
<220>
<221> variant
      (10)..(10)
<222>
<223> N = T or A
<220>
<221>
      variant
<222>
      (11)..(11)
\langle 223 \rangle N = C or T
```

<220> <221>

<222>

<220>

variant

 $\langle 223 \rangle$ N = C or T

<221> variant

(15)..(15)

```
<222> (21)..(21)
<223> N = C or T
<220>
<221> variant
<222> (27)..(27)
<223> N = C or T
<220>
<221> variant
<222> (45)..(45)
\langle 223 \rangle N = A or G
<220>
<221> variant
<222>
       (48)..(48)
\langle 223 \rangle N = T or C
<220>
<221> variant
<222>
       (59)..(59)
<223> N = C or G
<220>
<221> variant
<222> (61)..(61)
\langle 223 \rangle N = G or A
<220>
<221> variant
<222> (65)..(65)
<223> N = T or A
<220>
<221> variant
<222> (76)..(76)
<223> N = T or G
<220>
<221> variant
<222> (86)..(86)
\langle 223 \rangle N = T or C
<220>
<221> variant
<222> (96)..(96)
\langle 223 \rangle N = C or T
<220>
<221> variant
<222> (134)..(134)
<223> N = T or C
<220>
<221> variant
<222> (153)..(153)
\langle 223 \rangle N = T or C
```

```
<221> variant
 <222> (164)..(164)
 \langle 223 \rangle N = T or C
 <220>
 <221> variant
 <222> (182)..(182)
<223> N = A or T
 <220>
 <221> variant
 <222>
        (203)..(203)
 <223> N = A or G
 <220>
 <221> variant
 <222>
        (208)..(208)
 <223>
        N = T \text{ or } G
 <220>
 <221> variant
 <222>
        (220)..(220)
 <223> N = A or T
 <220>
 <221> variant
 <222>
       (222)..(222)
 <223> N = A or G
 <220>
 <221> variant
 <222> (225)..(225)
 <223> N = T or G
 <220>
 <221> variant
 <222>
       (228)..(228)
 \langle 223 \rangle N = A or G
 <220>
 <221> variant
 <222>
       (243)..(243)
 <223> N = T or C
 <220>
 <221> variant
 <222>
       (249)..(249)
 <223> N = T or C
 <220>
 <221> variant
 <222>
       (254)..(254)
 <223> N = T or C
 <400> 7
 acnaaacctn ngganggaaa ntgcacntgt attcccatcc catcntcntg ggctttcgna
                                                                         60
 anatnectat gggagnggge etcagneegt ttetentgge teagtttaet agtgeeattt
                                                                        120
                                                                        180
 gttcagtggt tcgnagggct ttcccccact gtntggcttt cagntatatg gatgatgtgg
 tnttgggggc caagtctgta cancatentg agtecetttn tneenetntt accaatttte
                                                                        240
```

<210> 8 <211> 230 <212> PRT <213> consensus <220> <221> misc_feature <222> (2)..(2) <223> X = N<220> <221> misc_feature <222> (49)..(49) $\langle 223 \rangle X = N$ <220> <221> misc feature <222> (52)..(52) $\langle 223 \rangle \cdot X = N$ <220> <221> misc_feature <222> (53)..(53) <223> X = N<220> <221> misc_feature <222> (55)..(55) <223> X = N<220> <221> misc_feature <222> (56)..(56) <223> X = N<220> <221> misc_feature <222> (65) ... (65) $\langle 223 \rangle X = N$ <220> <221> misc_feature <222> (69)..(69) <223> X = N<220> <221> misc_feature <222> (75)..(75) $\langle 223 \rangle X = N$ <220> <221> misc_feature <222> (195)..(195) $\langle 223 \rangle X = N$

```
<221> misc_feature
```

<222> (209)..(209)

<223> X = N

<220>

<221> misc_feature

<222> (211)..(211)

<223> X = N

<220>

<221> misc feature

<222> (222)..(222)

<223> X = N

<400> 8

Ser Xaa Asp Leu Ser Trp Leu Ser Leu Asp Val Ser Ala Ala Phe Tyr

1 10 15

His Ile Pro Pro Leu His Pro Ala Ala Met Pro His Leu Leu Ile Val 20 25 30

Gly Ser Ser Gly Leu Ser Asp Arg Tyr Val Ala Arg Leu Ser Ser Thr 35 40 45

Xaa Ser Arg Xaa Xaa Ile Xaa Xaa Tyr His Gln His Tyr Gly Arg Asp 50 60

Xaa Leu His Asp Xaa Ser Tyr Cys Ser Arg Xaa Gln Leu Tyr Val Ser 65 70 75 80

Leu Leu Met Leu Leu Tyr Lys Gln Thr Tyr Phe Gly Arg Trp Lys Leu 85 90 95

His Leu Tyr Leu Ser Ala His Pro Ile Ile Val Leu Gly Phe Arg Lys
100 105 110

Ile Leu Pro Met Gly Val Gly Gly Leu Ser Pro Phe Leu Leu Ala Gln
115 120 125

Phe Thr Ser Ala Ile Cys Leu Ala Ser Val Met Val Thr Arg Cys Arg 130 135 140

Ala Phe Phe Pro His Cys Leu Val Ala Val Phe Ser Ala Tyr Met Asp 145 150 155 160

Asp Val Leu Met Val Leu Gly Ala Lys Arg Ser Thr Val Gly Gln Glu 165 170 175

His Leu Ser Arg Glu Ser Phe Leu Phe Tyr Thr Ala Ala Ser Val Ile 180 185 190

Thr Cys Xaa Ser Phe Val Leu Leu Ser Asp Leu Val Gly Ile His Leu 195 200 205

Xaa Pro Xaa Gln Lys Thr Lys Arg Trp Gly Tyr Ser Leu Xaa Phe Met 210 215 220

Gly Tyr Val Ile Ile Gly

225	2:	30				
<210> 9 <211> 426 <212> DNA <213> HBV						
gtttgtcctc attcctgctc aactgcactt gcctcagtcc ctttccccca	tatgcctcat tacttccaag aaggaacctc gtattcccat gtttctcctg ctgtttggct tgagtccctt	aacatcaact tatgtttccc cccatcatct gctcagttta ttcagttata	accagcacgg tcttcttgct tgggctttcg ctagtgccat tggatgatgt	gaccatgcaa gtacaaaacc caagattcct ttgttcagtg ggtattgggg	gacctgcacg ttcggacgga atgggagtgg gttcgtaggg gccaagtctg	60 120 180 240 300 360 420 426
<210> 10 <211> 425 <212> DNA <213> HBV						
gtttgtcctc actcctgctc aactgcacct gcctcagtcc ctttcccca	tatgcctcat taattccagg aaggaacctc gtattcccat gtttctcttg ctgtctggct tgagtccctt	atcatcaacc tatgtttccc cccatcatct gctcagttta ttcagttata	accagcacag tcatgttgct tgggctttcg ctagtgccat tggatgatgt	gaccatgcaa gtacaaaacc caaaatacct ttgttcagtg ggttttgggg	aacctgcacg tacggacgga atgggagtgg gttcgtaggg gccaagtctg	60 120 180 240 300 360 420 425
<210> 11 <211> 426 <212> DNA <213> HBV						
gtttgtcctc attcctgctc aactgcactt gcctcagtcc ctttcccca	tatgcctcat tacttccagg aaggaacctc gtattcccat gtttctcctg ctgtttggct tgagtccctt	aacatcaact tatgtttccc cccatcatcc gctcagttta ttcagttata	accagcacgg tcttgttggt tgggctttcg ctagtgccat tggatgatgt	gaccatgcaa gtacaaaacc caagattcct ttgttcagtg ggtattgggg	gacctgcacg ttcggacgga atgggagtgg gttcgcaggg gccaagtctg	60 120 180 240 300 360 420 426
<210> 12 <211> 426 <212> DNA <213> HBV						
gtttgtcctc actcctgctc aattgcacct gcctcagccc	tatgcctcat taattccagg aaggaacctc gtattcccat gtttctcctg ctgtttggct	atcttcaact tatgtatccc cccatcatcc gctcagttta	accagcacgg tcctgttgct tgggctttcg ctagtgccat	gaccatgcag gtaccaaacc gaaaattcct ttgttcagtg	aacctgcacg ttcggacgga atgggagtgg gttcgtaggg	60 120 180 240 300 360

tacagcatct atttaa	tgagtccctt	tttaccgctg	ttaccaattt	tcttctgtct	ttgggtatac	420 426
<210> 13 <211> 426 <212> DNA <213> HBV						
gtttgtcctc actcctgctc aattgcacct gcctcagccc ctttccccca	taattccagg aaggaacctc gtattcccat gtttctcctg ctgtttggct	cttcttgttg atcttcaaca tatgtatccc cccatcatct gctcagttta ttcagttata tttaccgctg	accagcacgg tcctgttgct tgggctttcg ctagtgccat tggatgatgt	gaccatgcag gtaccaaacc gaaaattcct ttgttcagtg ggtattgggg	aacctgcacg ttcggacgga atgggagtgg gttcgtaggg gccaagtctg	60 120 180 240 300 360 420 426
<210> 14 <211> 426 <212> DNA <213> HBV						
gtttgtcctc actcctgctc aattgcacct gcctcagccc ctttccccca	taattccagg aaggaacctc gtattcccat gtttctcctg ctgtttggct	cttcttgttg atcctcaacc tatgtatccc cccatcatcc gctcagttta ttcagttata tttaccgctg	accagcacgg tcctgttgct tgggctttcg ctagtgccat tggatgatgt	gaccatgccg gtaccaaacc gaaaattcct ttgttcagtg ggtattgggg	aacctgcacg ttcggacgga atgggagtgg gttcgtaggg gccaagtctg	60 120 180 240 300 360 420 426
<210> 15 <211> 426 <212> DNA <213> HBV						
gtttgtcctc actcctgctc aattgcacct gcctcagtcc ctttcccca	taattccagg aaggcaactc gtattcccat gtttctcttg ctgtttggct	cttcttattg atcaacaaca tatgtttccc cccatcgtcc gctcagttta ttcagctata tataccgctg	accagtacgg tcatgttgct tgggctttcg ctagtgccat tggatgatgt	gaccatgcaa gtacaaaacc caaaatacct ttgttcagtg ggtattgggg	aacctgcacg tacggatgga atgggagtgg gttcgtaggg gccaagtctg	60 120 180 240 300 360 420 426
<210> 16 <211> 426 <212> DNA <213> HBV						
gtttgtcctc attcctgctc aactgcactt	tacttccagg aaggaacctc gtattcccat	cttcttgttg aacatcaacc tatgtttccc cccatcatcc gctcagttta	accagcacgg tcttgttgct tgggctttcg	gaccatgcaa gtacaaaacc caagattcct	gacctgcacg ttcggacgga atgggagggg	60 120 180 240 300

		ttcagttata tttacctcta				360 420 426
<210> 17 <211> 426 <212> DNA <213> HBV						
gtttgtcctc attcctgctc aactgcactt gcctcagtcc ctttccccca	tacttccagg aaggaacctc gtattcccat gtttctcctg ctgtttggct	cttcttgttg aacatcaact tatgtttccc cccatcatcc gctcagttta ttcagttata tttacctcta	accagcacgg tcttgttgct tgggctttcg ctagtgccat tggatgatgt	gaccatgcaa gtacaaaacc caagattcct ttgttcagtg ggtattgggg	gacctgcacg ttcggacgga atgggagggg gttcgtaggg gccaagtctg	60 120 180 240 300 360 420 426
<210> 18 <211> 426 <212> DNA <213> HBV						
gtttgtcctc actactgctc aattgcacct gcctcagccc ctttccccca	taattccagg aaggaacctc gtattcccat gtttctcctg ctgtttggct	cttcttgttg atcctcaaca tatgtatccc cccatcatcc gctcagttta ttcagttata tttaccgctg	accagcacgg tcctgttgct tgggctttcg ctagtgccat tggatgatgt	gaccatgccg gtaccaaacc gaaaattcct ttgttcagtg ggtattgggg	gacctgcatg ttcggacgga atgggagtgg gttcgtaggg gccaagtctg	60 120 180 240 300 360 420
<210> 19 <211> 426 <212> DNA <213> HBV						
gtttgtcctc actcctgctc aattgcacct gcctcagccc ctttccccca	taattccagg aaggcaactc gtattcccat gtttctcctg ctgtttggct	cttcttgttg atcttcaacc tatgtatccc cccatcatct gctcagttta ttcagttata tttaccgctg	accagcacgg tcctgttgct tgggctttcg ctagtgccat tggatgatgt	gaccatgcag gtaccaaacc gaaaattcct ttgttcagtg ggtattgggg	gacctgcacg ttcggacgga atgggagtgg gttcgtaggg gccaagtctg	60 120 180 240 300 360 420 426
<210> 20 <211> 426 <212> DNA <213> HBV						
gtttgtcctc actcctgctc	taattccagg aaggaacctc	cttcttgttg atcatcaacc tatgtttccc cccatcatct	accagcacgg tcatgttgct	gaccatgcaa gtacaaaacc	gacctgcaca tatggatgga	60 120 180 240

```
ctttccccca ctgtctggct ttcagttata tggatgatgt ggtattgggg gccaagtctg
                                                                     360
                                                                     420
tacaacatct tgagtccctt tatgccgctg ttaccaattt tcttttgtct ttgggtatac
                                                                     426
atttaa
<210>
      21
<211>
      4084
<212>
      DNA
      HBV 1.28 genome
<213>
<400>
                                                                      60
ggacgacccc tcgcggggcc gcttgggact ctctcgtccc cttctccgtc tgccgttcca
geogaceacg gggegeacet etetttaege ggteteeceg tetgtgeett eteatetgee
                                                                     120
ggtccgtgtg cacttcgctt cacctctgca cgttgcatgg agaccaccgt gaacgcccat
                                                                     180
cagatectge ccaaggtett acataagagg actettggae teccageaat gteaacgaee
                                                                     240
gaccttgagg cctacttcaa agactgtgtg tttaaggact gggaggagct gggggaggag
                                                                     300
                                                                     360
attaggttaa aggtctttgt attaggaggc tgtaggcata aattggtctg cgcaccagca
                                                                     420
ccatgcaact ttttcacctc tgcctaatca tctcttgtac atgtcccact gttcaagcct
ccaagetgtg cettgggtgg etttggggca tggacattga ceettataaa gaatttggag
                                                                     480
ctactgtgga gttactctcg tttttgcctt ctgacttctt tccttccgtc agagatctcc
                                                                     540
tagacaccgc ctcagctctg tatcgagaag ccttagagtc tcctgagcat tgctcacctc
                                                                     600
accatactgc actcaggcaa gccattctct gctgggggga attgatgact ctagctacct
                                                                     660
gggtgggtaa taatttggaa gatccagcat ccagggatct agtagtcaat tatgttaata
                                                                     720
ctaacatggg tttaaagatc aggcaactat tgtggtttca tatatcttgc cttacttttg
                                                                     780
                                                                     840
gaagagagac tgtacttgaa tatttggtct ctttcggagt gtggattcgc actcctccag
cctatagacc accaaatgcc cctatcttat caacacttcc ggaaactact gttgttagac
                                                                     900
                                                                     960
gacgggaccg aggcaggtcc cctagaagaa gaactccctc gcctcgcaga cgcagatctc
                                                                    1020
aatcgccgcg tcgcagaaga tctcaatctc gggaatctca atgttagtat tccttggact
                                                                    1080
cataaggtgg gaaactttac ggggctttat teetetacag tacetatett taateetgaa
                                                                    1140
tqqcaaactc cttcctttcc taaqattcat ttacaaqagg acattattaa taggtqtcaa
                                                                    1200
caatttqtqq qccctctcac tqtaaatqaa aaqagaagat tgaaattaat tatgcctgct
agattetate etacceacae taaatatttq eeettaqaca aaqqaattaa acettattat
                                                                    1260
ccagatcagg tagttaatca ttacttccaa accagacatt atttacatac tctttggaag
                                                                    1320
gctggtattc tatataagag ggaaaccaca cgtagcgcat cattttgcgg gtcaccatat
                                                                    1380
                                                                    1440
tcttgggaac aagagctaca gcatgggagg ttggtcatca aaacctcgca aaggcatggg
                                                                    1500
gacgaatett tetgtteeca accetetggg attettteec gateateagt tggaccetge
                                                                    1560
atteggagee aacteaaaca atceagattg ggaetteaac eecateaagg accaetggee
                                                                    1620
agcagccaac caggtaggag tgggagcatt cgggccaggg ctcacccctc cacacggcgg
tattttgggg tggagccctc aggctcaggg catattgacc acagtgtcaa caattcctcc
                                                                    1680
                                                                    1740
tectgeetee accaategge agteaggaag geageetaet eccatetete cacetetaag
agacagtcat cetcaggeca tgeagtggaa ttecactgee ttecaceaag etetgeagga
                                                                    1800
teccagagte aggggtetgt atetteetge tggtggetee agtteaggaa cagtaaacce
                                                                    1860
                                                                    1920
tgctccgaat attgcctctc acatctcgtc aatctccgcg aggactgggg accctgtgac
gaacatggag aacatcacat caggatteet aggaceeetg etegtgttae aggeggggtt
                                                                    1980
                                                                    2040
tttcttgttg acaagaatcc tcacaatacc gcagagtcta gactcgtggt ggacttctct
caattttcta gggggatctc ccgtgtgtct tggccaaaat tcgcagtccc caacctccaa
                                                                    2100
                                                                    2160
tcactcacca acctcctgtc ctccaatttg tcctggttat cgctggatgt gtctgcggcg
                                                                    2220
ttttatcata ttcctcttca tcctgctgct atgcctcatc ttcttattgg ttcttctgga
                                                                    2280
ttatcaaggt atgttgcccg tttgtcctct aattccagga tcaacaacaa ccagtacggg
                                                                    2340
accatgcaaa acctgcacga ctcctgctca aggcaactct atgtttccct catgttgctg
                                                                    2400
tacaaaacct acggatggaa attgcacctg tattcccatc ccatcgtcct gggctttcgc
                                                                    2460
aaaataccta tgggagtggg cctcagtccg tttctcttgg ctcagtttac tagtgccatt
                                                                    2520
tgttcagtgg ttcgtagggc tttcccccac tgtttggctt tcagctatat ggatgatgtg
                                                                   2580
gtattggggg ccaagtctgt acagcatcgt gagtcccttt ataccgctgt taccaatttt
                                                                    2640
2700
aacttcatgg gctacataat tggaagttgg ggaactttgc cacaggatca tattgtacaa
                                                                    2760
aagatcaaac actgttttag aaaacttcct gttaacaggc ctattgattg gaaagtatgt
caaagaattg tgggtctttt gggctttgct gctccattta cacaatgtgg atatcctgcc
                                                                    2820
ttaatgcctt tgtatgcatg tatacaagct aaacaggctt tcactttctc gccaacttac
                                                                    2880
```

gcctcagtcc gtttctcttg gctcagttta ctagtgccat ttgttcagtg gttcgtaggg

300

```
aaggeettte taagtaaaca gtacatgaac etttaceeeg ttgeteggea aeggeetggt
                                                                     2940
ctgtgccaag tgtttgctga cgcaaccccc actggctggg gcttggccat aggccatcag
                                                                     3000
cgcatgcgtg gaacctttgt ggctcctctg ccgatccata ctgcggaact cctagccgct
                                                                     3060
tgttttgctc gcagccggtc tggagcaaag ctcatcggaa ctgacaattc tgtcgtcctc
                                                                     3120
tegeggaaat atacategtt tecatggetg etaggetgta etgecaaetg gateettege
                                                                     3180
gggacgtcct ttgtttacgt cccgtcggcg ctgaatcccg cggacgaccc ctcgcggggc
                                                                     3240
egettgggae tetetegtee eetteteegt etgeegttee ageegaeeae ggggegeaee
                                                                     3300
tetetttaeg eggteteece gtetgtgeet teteatetge eggteegtgt geactteget
                                                                     3360
tcacctctgc acgttgcatg gagaccaccg tgaacgccca tcagatcctg cccaaggtct
                                                                     3420
tacataaqaq gactcttgqa ctcccaqcaa tqtcaacqac cgaccttqag gcctacttca
                                                                     3480
aagactgtgt gtttaaggac tgggaggagc tgggggagga gattaggtta aaggtctttg
                                                                     3540
                                                                     3600
tattaggagg ctgtaggcat aaattggtct gcgcaccagc accatgcaac tttttcacct
etgectaate atetettgta catgteccae tgttcaagee tecaagetgt geettgggtg
                                                                     3660
gctttggggc atggacattg acccttataa agaatttgga gctactgtgg agttactctc
                                                                     3720
gtttttgcct tctgacttct ttccttccgt cagagatctc ctagacaccg cctcagctct
                                                                     3780
                                                                     3840
gtatcgagaa gccttagagt ctcctgagca ttgctcacct caccatactg cactcaggca
agccattctc tgctggggg aattgatgac tctagctacc tgggtgggta ataatttgga
                                                                     3900
                                                                     3960
agatecagea tecagggate tagtagteaa ttatgttaat aetaacatgg gtttaaagat
caggcaacta ttgtggtttc atatatcttg ccttactttt ggaagagaga ctgtacttga
                                                                     4020
                                                                     4080
atatttggtc tctttcggag tgtggattcg cactcctcca gcctatagac caccaaatgc
                                                                     4084
ccct
<210>
       22
<211>
       4496
<212>
       DNA
<213>
       HBV 1.5 genome
<400>
       22
                                                                       60
                                                                      120
                                                                      180
```

gatatcctgc cttaatgcct ttgtatgcat gtatacaagc taaacaggct ttcactttct cgccaactta caaggeettt ctaagtaaac agtacatgaa cetttaceee gttgetegge aacggcctgg tctgtgccaa gtgtttgctg acgcaacccc cactggctgg ggcttggcca 240 taggecatea gegeatgegt ggaacetttg tggeteetet geegateeat aetgeggaac 300 tcctagccgc ttgttttgct cgcagccggt ctggagcaaa gctcatcgga actgacaatt ctgtcgtcct ctcgcggaaa tatacatcgt ttccatggct gctaggctgt actgccaact 360 ggateetteg egggaegtee titgtitaeg teeegtegge getgaateee geggaegaee 420 cetegegggg cegettggga etetetegte ecetteteeg tetgeegtte eageegaeea 480 eggggegeac etetetttae geggteteec egtetgtgee tteteatetg eeggteegtg 540 tgcacttege ttcacctetg cacgttgcat ggagaccacc gtgaacgccc atcagatcct 600 gcccaaggtc ttacataaga ggactcttgg actcccagca atgtcaacga ccgaccttga 660 ggcctacttc aaagactgtg tgtttaagga ctgggaggag ctgggggagg agattaggtt 720 780 aaaggtettt gtattaggag getgtaggea taaattggte tgegeaceag caccatgeaa 840 ctttttcacc tctgcctaat catctcttgt acatgtccca ctgttcaagc ctccaagctg 900 tgccttgggt ggctttgggg catggacatt gacccttata aagaatttgg agctactgtg gagttactct cgtttttgcc ttctgacttc tttccttccg tcagagatct cctagacacc 960 1020 gcctcagctc tgtatcgaga agccttagag tctcctgagc attgctcacc tcaccatact gcactcaggc aagccattct ctgctggggg gaattgatga ctctagctac ctgggtgggt 1080 1140 aataatttgg aagatccagc atccagggat ctagtagtca attatgttaa tactaacatg ggtttaaaga tcaggcaact attgtggttt catatatctt gccttacttt tggaagagag 1200 actgtacttg aatatttggt ctctttcgga gtgtggattc gcactcctcc agcctataga 1260 ccaccaaatg cccctatctt atcaacactt ccggaaacta ctgttgttag acgacgggac 1320 cgaggcaggt cccctagaag aagaactccc tcgcctcgca gacgcagatc tcaatcgccg 1380 cgtcgcagaa gatctcaatc tcgggaatct caatgttagt attccttgga ctcataaggt 1440 gggaaacttt acggggcttt attcctctac agtacctatc tttaatcctg aatggcaaac 1500 tccttccttt cctaagattc atttacaaga ggacattatt aataggtgtc aacaatttgt 1560 1620 gggccctctc actgtaaatg aaaagagaag attgaaatta attatgcctg ctagattcta 1680 tcctacccac actaaatatt tgcccttaga caaaggaatt aaaccttatt atccagatca 1740 ggtagttaat cattacttcc aaaccagaca ttatttacat actctttgga aggctggtat 1800 tctatataag agggaaacca cacgtagcgc atcattttgc gggtcaccat attcttggga acaagagcta cagcatggga ggttggtcat caaaacctcg caaaggcatg gggacgaatc 1860

```
tttctgttcc caaccctctg ggattctttc ccgatcatca gttggaccct gcattcggag
                                                                     1920
ccaactcaaa caatccagat tgggacttca accccatcaa ggaccactgg ccagcagcca
                                                                     1980
accaggtagg agtgggagca ttcgggccag ggctcacccc tccacacggc ggtattttgg
                                                                     2040
ggtggagccc tcaggctcag ggcatattga ccacagtgtc aacaattcct cctcctgcct
                                                                     2100
ccaccaatcg gcagtcagga aggcagccta ctcccatctc tccacctcta agagacagtc
                                                                     2160
atcctcaggc catgcagtgg aattccactg ccttccacca agctctgcag gatcccagag
                                                                     2220
tcaggggtct gtatcttcct gctggtggct ccagttcagg aacagtaaac cctgctccga
                                                                     2280
atattgcctc tcacatctcg tcaatctccg cgaggactgg ggaccctgtg acgaacatgg
                                                                     2340
agaacatcac atcaggattc ctaggacccc tgctcgtgtt acaggcgggg tttttcttgt
                                                                     2400
tgacaagaat cctcacaata ccgcagagtc tagactcgtg gtggacttct ctcaattttc
                                                                     2460
tagggggatc tecegtgtgt ettggeeaaa attegeagte eecaacetee aateacteae
                                                                     2520
caacctcctg tcctccaatt tgtcctggtt atcgctggat gtgtctgcgg cgttttatca
                                                                     2580
tattcctctt catcctgctg ctatgcctca tcttcttatt ggttcttctg gattatcaag
                                                                     2640
gtatgttgcc cgtttgtcct ctaattccag gatcaacaac aaccagtacg ggaccatgca
                                                                     2700
aaacctgcac gactcctgct caaggcaact ctatgtttcc ctcatgttgc tgtacaaaac
                                                                     2760
ctacggatgg aaattgcacc tgtattccca tcccatcgtc ctgggctttc gcaaaatacc
                                                                     2820
tatgggagtg ggcctcagtc cgtttctctt ggctcagttt actagtgcca tttgttcagt
                                                                     2880
ggttcgtagg gctttccccc actgtttggc tttcagctat atggatgatg tggtattggg
                                                                     2940
                                                                     3000
ggccaagtet gtacagcate gtgagteeet ttataceget gttaccaatt ttettttgte
tctgggtata catttaaacc ctaacaaaac aaaaagatgg ggttattccc taaacttcat
                                                                     3060
                                                                     3120
gggctacata attggaagtt ggggaacttt gccacaggat catattgtac aaaagatcaa
acactgtttt agaaaacttc ctgttaacag gcctattgat tggaaagtat gtcaaagaat
                                                                     3180
tgtgggtctt ttgggctttg ctgctccatt tacacaatgt ggatatcctg ccttaatgcc
                                                                     3240
tttgtatgca tgtatacaag ctaaacaggc tttcactttc tcgccaactt acaaggcctt
                                                                     3300
tctaagtaaa cagtacatga acctttaccc cgttgctcgg caacggcctg gtctgtgcca
                                                                     3360
agtgtttgct gacgcaaccc ccactggctg gggcttggcc ataggccatc agcgcatgcg
                                                                     3420
tggaaccttt qtggctcctc tgccgatcca tactgcggaa ctcctagccg cttgttttgc
                                                                     3480
tegeaqeeqg tetggageaa ageteategg aactgacaat tetgtegtee tetegeggaa
                                                                     3540
atatacateg tttccatqqc tqctaqqctq tactqccaac tqqatccttc qcqqqacqtc
                                                                     3600
etttgtttac gtcccgtcgg cgctgaatcc cgcggacgac ccctcgcggg gccgcttggg
                                                                     3660
actetetegt eccettetee gtetgeegtt ecageegace acggggegea cetetettta
                                                                     3720
egeggtetee cegtetgtge etteteatet geeggteegt gtgeaetteg etteacetet
                                                                     3780
gcacgttgca tggagaccac cgtgaacgcc catcagatcc tgcccaaggt cttacataag
                                                                     3840
aggactettg gacteceage aatgteaaeg acegacettg aggeetaett caaagactgt
                                                                     3900
gtgtttaagg actgggagga gctgggggag gagattaggt taaaggtctt tgtattagga
                                                                     3960
ggctgtaggc ataaattggt ctgcgcacca gcaccatgca actttttcac ctctgcctaa
                                                                     4020
teatetettg tacatgtece actgtteaag cetecaaget gtgeettggg tggetttggg
                                                                     4080
gcatggacat tgacccttat aaagaatttg gagctactgt ggagttactc tcgtttttgc
                                                                     4140
cttctgactt ctttccttcc gtcagagatc tcctagacac cgcctcagct ctgtatcgag
                                                                     4200
aageettaga gteteetgag cattgeteac etcaccatac tgeactcagg caagecatte
                                                                     4260
tctgctgggg ggaattgatg actctagcta cctgggtggg taataatttg gaagatccag
                                                                     4320
catccaggga tctagtagtc aattatgtta atactaacat gggtttaaag atcaggcaac
                                                                     4380
                                                                     4440
tattgtggtt tcatatatct tgccttactt ttggaagaga gactgtactt gaatatttgg
tototttogg agtgtggatt ogcactooto cagootatag accaccaaat goocot
                                                                     4496
```

```
<210> 23
```

<223> Description of Artificial Sequence: Amino acid sequence of a surface antigen of HBV beginning from amino acid position 108.

<400> 23

Pro Leu Leu Pro Arg Thr Ser Thr Ser Thr Gly Pro Cys Lys Thr
5 10 15

<211> 119

<212> PRT

<213> Artificial Sequence

<220>

Cys Thr Ile Pro Ala Gln Gly Thr Ser Met Phe Pro Ser Ser Cys Cys 20 25 30

Thr Lys Pro Ser Asp Gly Asn Cys Thr Cys Ile Pro Ile Pro Ser Ser 35 40 45

Trp Ala Phe Ala Arg Phe Leu Trp Glu Trp Ala Ser Val Arg Phe Ser 50 55 60

Trp Leu Ser Leu Leu Val Pro Phe Val Gln Trp Phe Val Gly Leu Ser 65 70 75 80

Pro Thr Val Trp Leu Ser Val Ile Trp Met Met Trp Tyr Trp Gly Pro
85 90 95

Ser Leu Tyr Asn Ile Leu Ser Pro Phe Leu Pro Leu Pro Ile Phe
100 105 110

Phe Cys Leu Trp Val Tyr Ile 115